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THE CIVIL FUNCTIONS PROGRAM OF THE CORPS OF ENGINEERS, UNITED STATES ARMY

REPORT

TO THE

COMMITTEE ON PUBLIC WORKS

HOUSE OF REPRESENTATIVES

BY MR. JONES OF ALABAMA

FROM THE

SUBCOMMITTEE TO STUDY CIVIL WORKS

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THE CIVIL FUNCTIONS PROGRAM OF THE CORPS OF ENGINEERS, UNITED STATES ARMY

Work of Subcommittee

On August 20, 1951, the Committee on Public Works adopted the following resolution:

> *Resolved*, That the chairman of the Committee on Public Works is hereby authorized to appoint a special subcommittee to study the policies, practices, and procedures in connection with the authorization and construction of river-and-harbor and flood-control projects and report back to the committee with the utmost dispatch its findings and recommendations thereon.

In accordance with this authority the chairman named a subcommittee which in due course was allotted funds and started work on its assignment with an especially recruited staff on October 1, 1951. The subcommittee has inspected work in the field and has conferred both in Washington and in the field with representatives of various departments and agencies of the executive branch, representatives of State and local governments, members of nongovernmental organizations, and with private citizens. Between March 27 and May 16, 1952, it held 20 public hearings at which Federal Government witnesses were heard from the Corps of Engineers, United States Army, the Department of Agriculture, the Department of the Interior, the Federal Power Commission, and the Tennessee Valley Authority. The transcripts of these hearings have been published in three volumes.

Work on the subcommittee assignment has served to emphasize the widespread distribution of reponsibility within the Federal establishment for the development and utilization of the water resources of the Nation's rivers and harbors. The subcommittee studies have disclosed that there are 38 principal agencies of the executive branch directly responsible in varying degrees for water-resource development and utilization. Another 13 agencies are intermittently and collaterally concerned with the subject matter. There are seven committees of the House of Representatives which are assigned definite responsibilities in the field and at least another four committees have responsibilities which bring them into the consideration of water resource development.

The hearings disclosed considerable information of interest to other committees of Congress. It has been the effort of the subcommittee to restrict the entire content of its report in general and its recommendations in particular to matters of direct concern to the Committee on Public Works. It believes, however, that these reports will be of interest to several of the other standing committees of the House of Representatives in connection with their assigned responsibilities.

The subcommittee knows that it has not arrived at a single complete solution to the many problems concerning the Federal water-resource development program. It believes, however, that its recommenda-

tions if adopted will mark substantial progress in the development, execution, and control of these programs. Further, your subcommittee is of the opinion that a permanent subcommittee of the Committee on Public Works should be specifically assigned responsibility for oversight and review of the water resource development programs coming under the jurisdiction of the committee and for study of the interrelationship unavoidably existing with programs and activities assigned as responsibilities of other committees of the Congress.

The subcommittee has not attempted specifically to prove or disprove any of the many charges which have been made about the civil works program executed by the Corps of Engineers on the basis of authorizations recommended by the Public Works Committees. Rather, it has examined the policies, procedures, and practices involved in the authorization and construction of the improvement of rivers and harbors for navigation, flood control, and other purposes. The findings of the subcommittee concerning the Corps of Engineers, its civil functions operations, and its relationships with Congress are sufficiently important to be the exclusive subject of a report to the Committee on Public Works. This document constitutes that report. Subsequent reports will consider other aspects of the water-resource development program germane to the responsibilities of the Committee on Public Works.

Summary

The subcommittee finds that there is authorized a very large volume of river and harbor and flood-control work for prosecution by the Corps of Engineers. The probable cost is only generally estimated and the time to complete the work can be only guessed at. Some of the authorized work will never be undertaken. Costs have advanced since the projects were authorized and they can be expected to change further. While the projects were considered economically justified at the time of their authorization, their present worthiness and economic merit has not been reviewed by the committee. Notwithstanding the large backlog of authorized projects, it appears that works may be more urgently needed in other localities. Some of the authorizations are based on rather detailed surveys of individual projects whereas others are based on only general basin-wide programs.

There is a large backlog of surveys which have not been completed but which have been on the books for a number of years, and on the other hand additional surveys are needed in current problem areas.

The subcommittee believes that there is a necessity of revising the program so that it is current and of then keeping it current. This means that existing procedures must be changed.

The subcommittee believes that such control of the program as is exercised today lies largely with the Corps of Engineers and the Bureau of the Budget, and to some extent with the Appropriations Committees. It believes that the Public Works Committee must participate more actively in exercising adequate control.

It is the view of your subcommittee that the Committee on Public Works should exercise a sufficiently close supervision over the administration and execution of river and harbor and flood-control laws so that it is assured that when funds are sought for the initiation of authorized projects, it approves the scope, cost, economic justification, and priority. It believes that the Committee on Public Works cannot be

satisfied merely with acceptance of proposals at the time of their authorization. Rather, the programs it has authorized for prosecution by the Corps of Engineers, the Bureau of Reclamation, the power administrations of the Interior Department, and other agencies must be kept under surveillance at all times.

The need for orderly prosecution of the water resource development program becomes more apparent each year. It is a significant part of our whole national program. It must be properly related to the balance of the program and must within itself be scheduled to provide economic accomplishment. There is a need therefore for the annual review by the committee not only of current progress and the proposed next year's project program but also of the schedule of work for the next several years ahead. Six-year programs should be prepared and kept current to reflect new authorizations, the annual budget and annual appropriations.

In light of the situation summarized above and discussed in more detail in this report, the subcommittee makes the recommendations set forth below generally directed at the program under charge of the Corps of Engineers, United States Army.

Recommendations

Your subcommittee recommends:

(1) That further authorizations for construction of river and harbor and flood-control projects without provision for subsequent review as hereinafter described not be made.

(2) That prior to requesting appropriations for the initiation of projects, integral units thereof, or other works of construction heretofore or hereafter authorized by flood-control acts or river and harbor acts, the responsible agency report to the Committee on Public Works on the proposed work in light of current considerations, if—

(*a*) More than 5 years shall have elapsed between the time the work was authorized and the time construction is proposed to be initiated.

(*b*) Authorization was based on the general approval of a basin program.

(*c*) Present plans contemplate changes in scope or purpose.

(*d*) Changes of design or engineering features, resulting in cost increases of 10 percent or more are proposed.

(*e*) Price fluctuations have changed the relationship of local contribution to Federal cost by 10 percent or more.

(*f*) Land acquisition costs have advanced by 10 percent or more.

(*g*) Changes due to unforeseen conditions or inadequacy result in cost estimate increases of 10 percent or more.

(3) That such reports be presented to the Committee on Public Works no later than May 1 of the year in which presentation of estimates for appropriation for initiation of the works to the Bureau of the Budget is proposed.

(4) That such reports include as a minimum a complete description of the project indicating any changes from the project as described in the survey reports; up-to-date estimates of construction cost; a statement of the most economical construction schedule and estimated money requirements; up-to-date economic analysis; a statement of relocation and land acquisition requirements; and the status of local cooperation.

(5) That requests for appropriations to the Bureau of the Budget and to the Appropriations Committee be submitted only for such of those projects or works as are positively approved for initiation by resolution of the House Committee on Public Works subsequent to receipt by the latter committee of the reports described in the paragraphs Nos. (2), (3), and (4) of these recommendations.

(6) That annually, at the time of presentation of the budget of the United States to the Congress by the President, the agencies responsible for works of the nature set forth in paragraph 2 above submit to the Committee on Public Works, in such number as it may request, a report, with necessary maps and charts, on the current status and proposed progress on construction works provided for in that budget and its current 6-year program.

(7) That upon completion of a project a report of completion with full cost and benefit data in comparison with the originally approved project be submitted to the Committee on Public Works.

(8) That an annual appropriation be made to the agencies concerned to permit them to prepare the materials necessary to comply with recommendations Nos. (1) to (7) inclusive.

(9) That the conclusions of the subcommittee as to preliminary examinations and surveys as set forth on pages 10–11 of this report be included in these recommendations.

Background of Present Program

The Corps of Engineers of the United States Army is the agency of the executive branch of the Government which under law is primarily responsible for the improvement of rivers, harbors, and artificial waterways for navigation; for the control of floods on the rivers of the United States; for the undertaking of major drainage improvements; and for the development of hydroelectric energy incidental to works for the foregoing purposes. In addition, these civil-works functions of the Corps of Engineers have aspects directly related to the abatement of pollution; to the provision for municipal, industrial, and agricultural water supply; to the preservation of fish and wildlife; and to the provision of recreation.

The Corps of Engineers has been responsible for improvement of rivers and harbors for navigation and related purposes since 1824. Since 1917 it has had the additional responsibility of flood-control work on the Sacramento River, Calif., and the Mississippi River, and since 1936 it has been responsible for the general flood-control program throughout the United States.

Recently, numerous serious criticisms have arisen both within and outside of the Government concerning this agency.

The Commission on Organization of the Executive Branch of the Government in March 1949 stated that among the glaring defects in the organization of services in the Government for water development and use were the policy conflicts existing between the Army engineers and the Bureau of Reclamation.

An article written by Leslie A. Miller, Chairman of the Natural Resources Committee of the Hoover Commission, and published in the spring of 1949 stated that he and his colleagues of the natural resources task force were amazed and dismayed to learn how billions were being squandered on duplicating badly engineered projects under

jurisdiction of the autocratic Army engineers and the Department of the Interior's spendthrift Bureau of Reclamation.

In August of 1951 a subcommittee of the House Appropriations Committee concluded that the costs of the river and harbor flood-control projects under construction by the Corps of Engineers had increased inordinately. That committee also was of the opinion that too many civil-works projects were under construction.

A statement to one of the committees of the House of Representatives on June 30, 1952, estimated that savings of $200,000,000 a year, with these savings increasing $50,000,000 a year thereafter as soon as the civil functions of the Army Corps of Engineers were consolidated with the water-resource-improvement work of the Bureau of Reclamation.

The foreword to a study of the Corps of Engineers and its operations published in October 1951 included the charge:

> No more lawless or irresponsible Federal group than the Corps of Army Engineers has ever attempted to operate in the United States either outside of or within the law.

At the hearings of this subcommittee, Lt. Gen. Lewis A. Pick, Chief of Engineers, United States Army, stated on March 27, 1952:

> I feel that these attacks, charges, and allegations have now proceeded to a point where they no longer represent constructive criticism in the public interest. They have become damaging to a useful Federal activity; they undermine public belief in the integrity of the Corps of Engineers; they reflect adversely upon the engineering profession as a whole. In fact, if I may be allowed to say so, I feel that they reflect adversely upon the wisdom and ability of the Congress.

VOLUME OF AUTHORIZED PROGRAM

Principal expenditures of the Corps of Engineers for its civil-works program are for projects authorized under river and harbor acts and under flood-control acts. The status of the program is summarized in table 1.

TABLE 1.—*Financial status, Corps of Engineers civil works, entire authorized program*

[Millions of dollars]

	Estimated Federal cost (1951)	New work	
		Funds appropriated through fiscal year 1952	Required to complete
Rivers and harbors	6,628.0	2,195.4	4,432.6
Flood control	10,040.5	3,161.5	6,879.0
Total	16,668.5	5,356.9	11,311.6

This summary tabulation shows that there exists an authorized backlog of work which on the basis of most recent estimates will require the expenditure of an additional $11.3 billion to complete. This backlog has been created through the exercise of a procedure of preliminary examinations, surveys, and authorizations. Examination of the process and controls exercised over the program should start with a review of the initial step—the preliminary examinations and surveys.

Preliminary Examinations and Surveys

Preliminary examinations and surveys are authorized by several methods. A single survey may be specifically directed by a particular law. More generally a number of examinations and surveys are authorized and directed by a section of the river and harbor or a flood-control act. Once such a survey is made and reported upon to the Congress, a review thereon may be undertaken if directed by a resolution of the Committee on Public Works of the House of Representatives or of the Senate. These examinations and surveys are assigned to the various district offices of the Corps of Engineers and undertaken according to the availability of funds. Before the report of any survey containing the views of the district engineer, the division engineer, and the Chief of Engineers is transmitted to Congress, the report is reviewed by the Board of Engineers for Rivers and Harbors established in 1902 and redefined in 1913. During the 21-year period 1930 through 1950 the Board of Engineers for Rivers and Harbors acted on 3,177 such reports. Its findings were unfavorable on 926 preliminary examinations and on 827 survey reports, a total of 55.2 percent of the total number involved. It reported favorably upon 1,424 survey reports, or 44.8 percent of the total.

While these figures indicate that the Board of Engineers for Rivers and Harbors has rejected approximately 55 percent of the proposals considered by the Corps of Engineers, it is to be noted that the statistics are not completely revealing. Frequently the subject of an adverse report will be reviewed or resurveyed at some subsequent date. Over a period of 20 years it is not unreasonable to find that proposed improvements for the same watercourse will have been studied several times. It would thus be possible for figures such as those quoted to include both the rejection and subsequent approval of the same proposal. The figures do, however, provide the best available statistical measurement of the volume of work and nature of results of the Board of Engineres for Rivers and Harbors.

As of January 1952 there were outstanding with the Corps of Engineers 987 examinations and surveys authorized under legislative procedure but upon which reports had not yet been submitted to Congress. Of this total number, 55 flood-control reports and 103 river and harbor reports had been completed in the field and were under review at various levels between the Board of Engineers for Rivers and Harbors and the Congress. Of the remaining number on which the field work had not been completed, 443 were flood control and 386 river and harbor.

In the course of the public hearings, the Chief of Engineers advised that the sum of $22,507,000 would be needed to complete these outstanding surveys and that the time necessary for their completion would be from 5 to 6 years. While the estimated time required is consistent with the rate of work experienced between 1920 and 1950, further examination of the outstanding survey program discloses that 10 of the reports were called for between 1927 and 1929 and another 93 have been on the books since the decade of the 1930's. Only 41 authorized during the 4-year period 1940 through 1943 are outstanding, and the remaining 843 have been authorized since 1944.

The fact that some pending reports were called for 25 years ago and that over 10 percent of those outstanding were authorized prior to

1940 seems to indicate both questionable procrastination and favoritism in the prosecution of this phase of work.

While it may well be that any needs for improvement of these rivers and waterways may be considerably less urgent than those for other streams, the subcommittee is inclined to question an agency procedure and policy that keeps requests active but unanswered for such a period.

Random examination of 10 reports submitted in 1947 showed that the time between authorization of the survey and its submission to Congress varied from 1.3 to 22.2 years and averaged 6.9 years. While these 10 reports were submitted to Congress between January 31 and June 9, 1947, 5 of the recommended improvements were authorized in the act approved June 30, 1948, and 5 had already been authorized by the 1946 acts.

The present form of legislation authorizing surveys for rivers and harbors improvement reads as follows:

> The Secretary of the Army is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following-named localities, the cost thereof to be paid from appropriations heretofore or hereafter made for such purposes: *Provided*, That no preliminary examination, survey, project, or estimate for new works other than those designated in this title or some prior Act or joint resolution shall be made: *Provided further*, That after the regular or formal reports made as required by law on any examination, survey, project, or work under way or proposed are submitted, no supplemental or additional report or estimate shall be made unless authorized by law.

Similar legislation authorizing flood-control surveys is set forth in the following language:

> The Secretary of the Army is hereby authorized and directed to cause preliminary examinations and surveys for flood control and allied purposes, including channel and major drainage improvements, and floods aggravated by or due to wind or tidal effects to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its Territorial possessions, which include the following-named localities, and the Secretary of Agriculture is authorized and directed to cause preliminary examinations and surveys for runoff and water-flow retardation and soil-erosion prevention on such drainage areas, the cost thereof to be paid from appropriations heretofore or hereafter made for such purposes: *Provided*, That, after the regular or formal reports made on any examination, survey, project, or work under way or proposed are submitted to Congress, no supplemental or additional report or estimate shall be made unless authorized by law except that the Secretary of the Army may cause a review of any examination or survey to be made and a report thereon submitted to Congress if such review is required by the national defense or by changed physical or economic conditions.

Especially noteworthy is the exception in flood-control law to the prohibition against supplemental or additional reports once those specifically called for shall have been rendered. Another exception to this prohibition is set forth in section 6 of the Rivers and Harbors Act approved August 30, 1935, which provides specifically that the 308 surveys—

> shall be supplemented by such additional study or investigation as the Chief of Engineers finds necessary to take into account, important changes in economic factors as they occur, and additional stream-flow records or other factual data.

The Rivers and Harbors Act approved March 4, 1913, provided in section 4 that the Board of Engineers for Rivers and Harbors shall, on request by resolution of the Committee on Commerce of the Senate or the Committee on Rivers and Harbors of the House of Representatives submit to the Chief of Engineers, examine and review the

report of any examination or survey made pursuant to any act or resolution of Congress and report thereon through the Chief of Engineers, United States Army, who shall submit his conclusions thereon as in other cases. The legislative authority prohibits the extension by the Board, in its report called for by committee resolution, of the scope of the project contemplated in the original report upon which the review has been requested or in the provision of law authorizing the original examination or survey.

In discussing the examination and survey procedure, the Chief of Engineers stated to the subcommittee on March 28, 1952, that—

> Requests for projects come from the people, and it may result in a request upon their Congressman or Senator concerned for a resolution to have a preliminary investigation, a survey, or a review report on some particular feature. It does not originate with the Corps of Engineers or any other governmental agency that I know of.

Previously that witness had pointed to the existing procedure providing for individual authorization of investigations of projects as contrasted with blanket authorization made under other laws for investigations of certain other phases of water-resource development by other Federal agencies as an example of the retention by Congress of a greater degree of control over the civil-works program of the Corps of Engineers than is required for other Federal activities in this field.

It appears then that establishment and control of the magnitude of the survey program rests practically exclusively in the hands of Congress. An obvious question that arises in light of the size of the existing authorized backlog of construction work and of the authorized backlog of examinations and surveys is why there is a need for developing a further backlog.

The subcommittee is of the opinion that the art and science of water-resource development engineering is not yet sufficiently stable to permit a plan to be set up at one time which will be for all time the best plan. Not only are new methods in the engineering use of materials being developed, but new meteorological and hydrological occurrences add to the knowledge basically necessary for the design of water-resource development works. Economic and social changes in community development have their effect upon water-resource development.

In light of the continuing changes and the length of time involved between starting and completing surveys, the subcommittee is inclined to believe, first, that there is a definite necessity for continuing the survey program and, second, that the present restrictive practices as to supplemental reports are unsound.

An example of the situation facing the committee is exceptionally well illustrated by consideration of one survey report. There is now pending before the committee a report on the Kansas River and tributaries, Colorado and Nebraska (H. Doc. 642, 81st Cong., 2d sess.). This report was submitted in response to requests contained in the Flood Control Acts of June 22, 1936, and June 28, 1938, and three resolutions of the Committee on Flood Control of the House of Representatives adopted in 1936, 1940, and 1944 calling for reviews of segments of the 308 report on the Kansas River (H. Doc. 195, 73d Cong.). The report of the district engineer is dated March 15, 1947; that of the Board of Engineers for Rivers and Harbors, October

19, 1948; and that of the Chief of Engineers, February 28, 1949. The reports were transmitted to the Speaker of the House of Representatives by the Secretary of the Army under date of June 21, 1950, and were referred to the Committee on Public Works on July 13, 1950. The Flood Control Act of 1950 had become law on May 17, 1950, after consideration through two sessions of Congress, and the report was too late for that bill.

In July 1951 a record disastrous flood occurred on the Kansas River. An inspection was made in the field by the Subcommittee on Flood Control of the Committee on Public Works, and hearings were held in Washington, D. C.; St. Louis, Mo.; and Topeka, Kans.

The standard project flood considered for design purposes in the pending report presumed a discharge at Kansas City of 370,000 cubic feet per second and at Topeka of 340,000 cubic feet per second. According to the testimony of the Corps of Engineers given on July 31, 1951, the discharge at Kansas City that month approximated 500,000 cubic feet per second, and the discharge at Topeka, 380,000 cubic feet per second. Obviously the hydrologic and hydraulic bases of design in the pending recommended project are outdated.

The Engineering News-Record cost index has risen since March 1947, the date of the district engineer's report, from 395.45 to 570.65 in July 1952, approximately 45 percent. Therefore, cost figures in the pending report are essentially obsolete.

The views of the Governors of Kansas and Colorado, of the Secretaries of Interior and Agriculture, and of the Federal Power Commission are of limited pertinence today in view of the obsolescent, if not obsolete, characteristics of the basic report.

Assuming that the pending report on the Kansas River is considered by the committee at the time it next considers an omnibus bill, a project could be adopted along the lines of practice in recent years authorizing the works recommended in the subject report—

> generally in accordance with the plans of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable.

Presumably representatives of the Corps of Engineers would at public hearings on the omnibus bill explain something of the modifications at that time considered necessary and desirable. However, the public record would indicate that the authorized project was based on obsolete engineering and cost data. Details of the works as actually built would be delegated to the Corps of Engineers, the reviewing agencies of the executive branch, and the Appropriations Committees of Congress.

It is the belief of your subcommittee that such action would constitute too great a delegation of the responsibilities vested in the Committee on Public Works. It is the view of the subcommittee that full control of the project as ultimately developed should remain with the Public Works Committee and that the public record show prior to construction the works actually proposed to be built under the authorization.

Immediately after the flood of July 1951 the Chief of Engineers exercised sound initiative and directed his organization to survey the situation and make pertinent recommendations to him. It is understood that a report has been prepared recommending some 22 reservoirs in addition to those proposed in the printed report now lying

before the committee, but this supplemental report has not been transmitted to Congress. While there is a general prohibition against making supplemental reports, the general language pertaining to surveys that has been included in the flood-control acts since that approved in 1941 includes the exception—

> that the Secretary of the Army may cause a review of any examination or survey to be made and a report thereon submitted to Congress if such review is required * * * by changed physical or economic conditions.

This language originated in the Flood Control Act of 1941. The Corps of Engineers, so far as is known, has never made specific use of this directive to submit a supplemental report to Congress. Representatives of the agency have indicated they prefer to let Congress take the initiative in starting specific surveys. Apparently they do not recognize this law as an expression of the initiative of Congress.

In this instance it appears that the necessary physical work has been undertaken and necessary costs have been incurred. Notwithstanding the changed physical conditions and the changed plans of the Corps of Engineers, Members of Congress wishing to study proposed plans on the subject are left with only the obsolescent report published as House Document 642, Eighty-first Congress, as their reference.

It can be expected that when hearings are held on the pending recommendations the substance of the supplemental report will be submitted to the committee as a part of the testimony of the Corps of Engineers. However, if this report is then submitted, it can be expected to be exclusively a Corps of Engineers presentation without necessarily having with it pertinent views of the Governors of Colorado and Kansas and of the Secretary of the Interior, as required by law; those of the Bureau of the Budget, as required by Executive order; and those of the Federal Power Commission and the Department of Agriculture which would appear to be directly relevant. Under present practice these interested agencies would not necessarily see the supplement and its revisions until after it was submitted to the Committee on Public Works.

It is the view of the subcommittee that such a supplemental report should be submitted to Congress in accordance with the existing authority and directive in law so that committee staff and members will have adequate opportunity for study prior to hearings and so that at the time of public hearings the pertinent views of properly interested public bodies will be available. The initiative shown in expending funds to make the supplemental study is commendable, but the breakdown in initiative from that point on and the failure to make the study available by this time indicates a monopolistic attitude inconsistent in a public agency properly concerned with the conservation and development of natural resources.

CONCLUSIONS AS TO SURVEY PROGRAM

It is the conclusion of the subcommittee that—

1. Preliminary examinations and surveys and reviews thereof should be continued currently regardless of the volume of backlog of authorized projects.

2. Basic control of the survey program for projects under jurisdiction of the Committee on Public Works should be maintained by the

committee and should not be completely delegated to the executive branch to the extent that is currently the procedure established by law for some agencies.

3. There should be provision for automatic cancellation of authority to undertake certain surveys when the need thereof or other circumstances lead to their being left incomplete or unstarted as long as some of those in the current backlog. The subcommittee suggests automatic cancellation for surveys not reported upon within 5 years of authorization.

4. Prior to the authorization of a survey, staff of the Public Works Committee should examine and make recommendations thereon, independent of advice of the executive branch.

5. The Secretary of the Army should require the Corps of Engineers to keep abreast of needed changes in recommended projects and to submit supplements to pending reports when the occasion warrants as currently authorized in law. This law was enacted to correct a deficiency in procedure. The flagrant disregard of its provisions by the Corps of Engineers is inexcusable.

6. An annual review of the entire survey program should be made by the committee, such review to revise the current program in order to keep it realistic and within the limits of budgetary feasibility.

Authorization of Construction Program

After a favorable report recommending an improvement is submitted to Congress, it is referred to the Committee on Public Works and there considered, with one of the principal steps in procedure being public hearings. Those projects favorably considered by the committee are recommended for authorization either by specific individual legislation or more generally by inclusion in an omnibus river and harbor or flood-control bill.

Project authorizations can be divided into three general categories: (*a*) An individual improvement at an estimated cost set forth in the project document or in the act (it is to be noted that the estimated cost thus set forth has never been considered a limitation of cost or a control on the project; it is actually merely informative); (*b*) an approval of a general plan as proposed in the project document but with authorization of construction for only a specified limited part of the plan; and (*c*) approval of a general plan with authorization for appropriation of a specific sum for the initiation and partial accomplishment of the project or for its continuation when it is already under way.

The Corps of Engineers states that it takes the position that authorizations of the second type limit specifically the works which may be undertaken and, if a monetary limitation is included, the funds that may be appropriated. In operating under authorizations of the third category, the Corps of Engineers reports that it takes the position that it may undertake any of the works involved in the improved plan subject only to the limit on appropriations.

The Corps of Engineers has advised the subcommittee that it considers that an authorized project is always specific and limited either in the report of the corps or in the authorization act and that the authorized plan may not be modified without additional authorization by Congress. The record of action by the Corps of Engineers does

not support this interpretation. This question of latitude of administrative modifications is considered in some detail in a later section of this report.

Status of Construction Program

The backlog of the civil-works program of the Corps of Engineers was estimated in January 1952 as $11.3 billion. Further details of this program are shown in tables 2, 3, and 4.

Summary of Status

Table 2.—*Current river and harbor program*

Status of projects	Number	New work (in millions of dollars)		
		Estimated Federal cost (1951)	Funds appropriated through fiscal year 1952	Required to complete
1. Completed	1,721	914.7	859.2	55.5
2. Under construction:				
In operation	75	1,367.8	1,052.9	314.9
Not yet in operation	114	1,171.4	271.1	900.3
Total under construction	189	2,539.2	1,324.0	1,215.2
3. Authorized, not started	369	3,174.1	12.2	3,161.9
Total	2,279	6,628.0	2,195.4	4,432.6
Complete or in operation	1,796	2,282.5	1,912.1	370.4
Under construction, not yet in operation	114	1,171.4	271.1	900.3
Not yet started	369	3,174.1	12.2	3,161.9
Total	2,279	6,628.0	2,195.4	4,432.6

Table 3.—*Current flood-control program*

Status of projects	Number	New work (in millions of dollars)		
		Estimated Federal cost (1951)	Funds appropriated through fiscal year 1952	Required to complete
1. Completed: Flood control, general	247	485.6	485.6	0
2. Under construction:				
In operation:				
Flood control, general	81	1,271.3	822.9	448.4
Mississippi River and tributaries	1	1,243.7	720.4	523.3
Sacramento	1	61.0	42.8	18.2
Total in operation	83	2,576.0	1,586.1	989.9
Not yet in operation	86	2,161.6	1,063.1	1,098.5
Total under construction	169	4,737.6	2,649.2	2,088.4
3. Authorized, not started: Flood control, general	580	4,817.3	26.7	4,790.6
Total (1, 2, and 3)	996	10,040.5	3,161.5	6,879.0
1. Complete or in operation	330	3,061.6	2,071.7	989.9
2. Under construction, not yet in operation	86	2,161.6	1,063.1	1,098.5
3. Not yet started	580	4,817.3	26.7	4,790.6
Total	996	10,040.5	3,161.5	6,879.0

Classified as to project status, the program may be summarized as in table 4.

TABLE 4.—*Authorized civil-works program, Corps of Engineers—Cost to complete*

[Millions of dollars]

Project status	Rivers and harbors	Flood control	Total
In operation	370.4	989.9	1,360.3
Under construction	900.3	1,098.5	1,998.8
Not yet started	3,161.9	4,790.6	7,952.5
Total	4,432.6	6,879.0	11,311.6

The Corps of Engineers reports that the estimates of cost for the work under construction are based upon working drawings and plans which it considers sufficiently reliable to provide relatively accurate figures. These estimates are backed by detailed plans and reflect construction experience. The estimates of the remaining backlog of approximately $8 billion of projects which have not been started fall into two categories. A portion presently estimated to cost $5 billion has the estimate based on some detailed planning. The remaining $3 billion of work is for projects that have not been planned beyond the survey stage. The present estimates are based on the survey figures adjusted by generally accepted cost indexes. It is to be expected from past experience that the estimates for this portion of the work will be changed, probably upward, when detailed plans are prepared.

From January 1952, when the Corps of Engineers' estimate was supplied to the subcommittee, to July 1952, the Engineering News-Record construction cost index increased 5 percent. On that basis it can be expected that the backlog at current prices would require approximately $11.9 billion for its accomplishment.

A total of 189 river and harbor projects under construction are presently estimated to cost $2,539 million and were estimated to cost $1,217 million at the time of their authorization. The 167 flood-control projects now under construction are presently estimated to cost $3,433 million, as compared with $1,656 million at the time they were authorized. It is for this group of projects that approximately $3,300 million of additional funds is necessary.

The backlog of work upon which construction has not yet been started consists of 580 flood-control projects now estimated to cost $4,817 million, as compared with $2,450 million at the time of their authorization, and 369 river and harbor projects estimated to cost $3,174 million, as compared to $1,665 million at the time of their authorization.

Because of the various price changes and the varying status of construction, it is difficult to trace the program clearly and accurately from its genesis. For example, numerous projects authorized since 1940 are under construction, and many authorized prior to that time have not yet been started. Nevertheless, comparison of a few figures illustrates the variance in rate of authorization as compared with the rate of prosecution. Exclusive of the Mississippi River flood-control project, the river and harbor and flood-control projects authorized for

construction by the Corps of Engineers since 1940 were estimated to cost $3,941 million at the time of their authorization. The backlog of projects upon which no construction has yet been undertaken was estimated to cost $4,115 million at the time of authorization. In other words, the volume of work yet to be started is greater than the total volume of work authorized since 1940.

It would be improper to conclude from these figures that no authorizations should have been made since 1940. Question can be raised, however, as to the validity of carrying on the list of authorized projects those which were approved some years ago and which are still inactive.

Creation of Backlog

Some review of authorizations since the midthirties will throw light on the reasons for the existing situation. A river and harbor act enacted in 1935 provided generally for the completion of a number of projects which had been started under the Public Works Administration program. Small additional bills were enacted in 1937 and 1938. In 1940 a bill limited exclusively to a few projects of urgent defense value was authorized. These three bills provided less than $100 million worth of work on the basis of estimates at the time of their enactment. In 1945 a large river and harbor bill was enacted to provide for works important to the economic advancement of the country which had been deferred first because of the defense program and later because of the war. In addition, it was anticipated that there might be a need for a shelf of authorized and planned projects in the event it should be deemed desirable to accelerate the Federal construction program during the economic adjustment from war to peace. In 1946 a second large river and harbor authorization was enacted generally based on the same reasoning. These two bills provided over $1,000,000,000 worth of work. In 1948 a very small bill was enacted and in 1950 a further enactment authorized a group of projects generally deemed necessary to meet the expanded needs of the country. In light of inflationary aspects, this latter bill could be considered to be of medium size as compared to others.

Concurrently with the creation of this backlog of rivers and harbors work has gone the establishment of a larger backlog of flood-control work. The general flood-control program was first adopted toward the end of fiscal year 1936. A slightly larger program was added in 1938, which reflects needs realized with the tremendous floods experienced in the Ohio Valley in 1937. As this program was brought under way, needs in other parts of the country were quickly recognized, but the defense situation, and later the war called for a practical halt to the work. In 1941 a bill smaller than either of the preceding two was enacted. Then in 1944 and 1946 two bills providing for over $1,500,000,000 worth of work became law. In 1948 a very small bill was added and in 1950 the largest bill thus far enacted added to the backlog. The size of the 1950 bill was in some part determined by the necessity to provide continuation of work previously approved on the Ohio, Missouri, and other major tributaries of the Mississippi River, along with programs in the other basins of the country.

The Mississippi River program originally adopted in 1928 was modified to a major extent in 1936 and the authorized cost increased to about $600,000,000. Since that time numerous small supplemental

elements have been added. In addition, a project for major bank stabilization and provision of a 12-foot navigation channel was adopted and increased appropriations were authorized to meet rising costs.

At the time of adoption, most of these authorizations seemed to be wise and proper. But neither domestic nor international events have followed expectations and predictions of the midforties.

Control of Program

At the time the subcommittee held public hearings, it was noted that appropriations for new work on the civil functions of the Corps of Engineers that had been made for fiscal years 1950, 1951, and 1952 averaged $502,919,600. At that rate of appropriation, it would take over 22 years to complete the authorized backlog of $11,311,600,000. The appropriation for new work in fiscal year 1953 totals $451,107,600. This amount is less than the probable increase in cost of the backlog as indicated by the rise in the Engineering News-Record construction index that took place during the first 6 months of 1952. With a new probable cost of the backlog of $11,900,000,000, it would take over a quarter century to complete the authorized program with appropriations becoming available at the same rate as that provided for fiscal year 1953.

On July 21, 1950, the President called upon the construction agencies of the executive branch to review their programs for the purpose of modifying them whenever practicable to lessen the demand upon services, commodities, raw materials, manpower, and facilities which are in competition with those needed for national defense. He directed that all civil public works programs be screened with the objective of deferring, curtailing, or slowing down those projects which do not directly contribute to defense or to essential civilian requirements.

It can be expected that if the international situation becomes no worse and as the defense production objectives are accomplished, there can be a relaxation of restrictions so that more rapid progress can be made. It is also possible that projects which at one time would not satisfy the criteria would, with the changing domestic situation and the passage of time, fall within the criteria.

While there are now before the Public Works Committee reports recommending some 130 projects estimated to cost over $1,100,000,000 the backlog contains many unstarted projects which have been authorized for a number of years. The going rivers and harbors program includes a few projects authorized in 1948 and a considerable number authorized in 1945 and 1946. On the other hand, the backlog of authorized rivers and harbors projects not yet started includes one authorized in 1917 and a large number authorized between 1930 and 1938. The going flood-control program includes a half dozen based on authorizations enacted in 1950 and several authorized in 1946 and 1948, while a large number of those authorized in 1936 and 1938 have not been started.

Obviously, the authorization of the present large volume of work has only established an approved list of projects and it does not provide a program realistically and adequately under the control of the Public Works Committee.

The Chief of Engineers, when he appeared before the subcommittee, stated that he believed that there should be a definite division placed between the projects which the Corps of Engineers considered as active and those which perhaps will never be built.

Further in his testimony, General Pick stated on the same subject:

> I come before this committee now intimating that such a (segregation) procedure * * * be undertaken because a great amount of criticism is being directed at the agencies charged with responsibility for handling this work and at the executive branch of the Government, and, if you will permit me to say so, Mr. Chairman, I believe toward the committee of the Congress itself because of the large number of authorizations which are now on the books.

As earlier quoted, elsewhere in his testimony in comment upon public criticisms of the civil-works program of the Corps of Engineers, General Pick said:

> I feel that they reflect adversely upon the wisdom and ability of the Congress.

The subcommittee notes that every one of the projects authorized by rivers and harbors or flood-control legislation for construction by the Corps of Engineers was so authorized upon recommendation by the Chief of Engineers that the project was necessary, desirable, and economically justified after a survey had been made under charge of the Corps of Engineers and had been reviewed by the Board of Engineers for Rivers and Harbors. If Congress or the Committee on Public Works is to be criticized because too large a volume of work has been authorized, or because unsound projects have been authorized, the fault lies in some measure in the degree of dependence that has been placed upon the Corps of Engineers of the Army by the committee and the Congress.

The subcommittee considers that it is confronted with two phases of the problem of control of authorizations. One concerns the authorizations now on the books; the other concerns future authorizations.

The subcommittee believes that the present backlog of authorized projects, particularly those which have not yet been started, should be reviewed and divided into two categories—those which still appear to be desirable, economically justified and of national importance, and those which for some reason or other now appear to be questionable. In some instances, local developments have changed since projects in the backlog have been authorized so that local interests are now indifferent or actually opposed to construction of the authorized work. There is a provision in the Flood Control Act of 1941 that says that a local protection project which has been authorized and not built in 5 years after local interests have been requested to assure their contribution is automatically deauthorized. To date only 14 projects estimated to cost $40,800,000 have become deauthorized through this process. Assurances have been formally requested on 35 projects and they will expire between 1952 and 1956 unless assurances are received. Formal assurances have not yet been requested on 325 other projects. These will not, under present law, be subject to deauthorization until a formal request for assurances has been made by the Corps of Engineers. There is no procedure for automatic cancellation of authorizations of the other flood-control projects, and there is no provision for automatic cancellation of authorization of any of the rivers and harbors projects.

As a first step in the review of the existing backlog, the subcommittee has called upon the Chief of Engineers to provide the initial material for making a segregation of projects into two categories, active and inactive. Recommendations are set forth hereinafter for establishing an improved control over future authorizations and programs.

Cost Estimating Experience

During the course of the hearings testimony was introduced by the Corps of Engineers, the Bureau of Reclamation, the Department of Agriculture, and the Tennessee Valley Authority in reference to their cost experiences.

Details of Corps of Engineers experience were based on 182 projects under construction during fiscal year 1951 and for which funds were requested for fiscal year 1952. In addition, the Corps of Engineers has presented estimates as of January 1952, for its entire authorized program on which work remains to be done.

The Bureau of Reclamation data were based on its present authorized construction program yet to be undertaken.

The Tennessee Valley Authority analysis was based on its authorized major river control projects, most of which are now completed and many of which were constructed during the period 1935–40. The data supplied by the three agencies are not strictly comparable.

The Corps of Engineers figures show that the 182 projects increased in cost 124 percent from the time they were initially considered by Congress. The total backlog of work of the Corps of Engineers was estimated in January 1952, to have increased in cost 99.5 percent over the estimate at the time the projects were originally considered by Congress.

Work under construction, exclusive of Mississippi and Sacramento River flood control, which is now estimated to cost $5,974,078,843, was estimated to cost $2,872,808,384 at the time of authorization. The authorized work which has not yet been started is now estimated to cost $7,991,404,700 as compared to $4,115,048,887 at the time of its consideration for authorization.

While all of this work was reported as economically justified at the time of its original consideration by Congress, the effects of the cost increases upon economic justification are not known to the subcommittee. Each project should be reexamined before funds are appropriated for its initiation.

The Bureau of Reclamation divided its projects into two categories—(1) the Missouri River Basin program, and (2) all other projects. The increase in cost of the total program, excluding the Missouri River Basin program, was stated to be 106 percent. The present estimated cost of the Missouri River program is approximately 274 percent greater than the figure used at the time the project was approved by Congress.

It was pointed out to the subcommittee that the Missouri River program estimate was only "tentative" at the time of its presentation and its consideration at this point does not appear warranted although in some respects it is comparable to estimates in the Army engineers' original 308 reports. (See p. 465, pt. 3, hearings.) Estimates of this character furnish an air of engineering authenticity to a report but

are worse than meaningless. They have no real validity and yet the absence of supporting data prevents adequate independent analysis. Congress is then misled into taking action on the basis of deceptive computations.

The analysis by both the Corps of Engineers and the Bureau of Reclamation indicated the components of the cost increases. Table 5 shows a comparison based on figures furnished by the two agencies.

TABLE 5.—*Analysis of components of cost increases*

	Percentage of increase by categories of cause	
	Bureau of Reclamation	Corps of Engineers
Price changes	30.2	[1] 57.8
Changes authorized by law	[2] 43.3	17.6
Structural and engineering modifications	2.8	6.3
To meet changed local needs	2.8	4.1
Unforeseen conditions	3.8	8.5
National emergency	1.0	
Inadequacy in planning	5.7	5.7
Administrative decision	8.0	
Other	2.9	
	100.0	100.0

[1] Many projects authorized on basis of preliminary estimates; reflects 1936 Flood Control Act authorizations based on 308 surveys.
[2] Includes authorized items not originally in estimate and changes made administratively under new finding of feasibility.

The Tennessee Valley Authority figures include a number of projects which were completed during a period when construction costs were relatively stable. The agency presentation states that the overrun amounts to 3.1 percent. Of the 19 projects included in the TVA presentation, only two were started since September 1945. The estimates on these two projects were also presented to Congress for the first time subsequent to September 1945.

In March 1936, the Tennessee Valley Authority presented to the Congress its program for development of the Tennessee River system. This report includes estimates of costs of 10 of the projects included in the study of 19. However, TVA's presentation to the subcommittee used the cost estimates in this report for only six projects all of which were listed as under way at the time the 1936 report was submitted. The estimate used in the study for the other four projects were those presented to the appropriations committees at the time funds were requested. If the preliminary figures used in the 1936 report were substituted for the later estimates, a greater overrun appears. Kentucky Dam cost 93.6 percent; Fort Loudoun Dam, 74.7 percent; and Fontana Dam, 137.7 percent more than the amounts given in the preliminary estimate. The four projects, for which estimates were included in the 1936 report and for which later estimates are used in the study, were built between 1938 and 1945. The final total cost of these four projects exceeded the original estimate by 81 percent.

The estimated cost of the authorized 11 project flood-control program of the Department of Agriculture as set forth in the Flood Control Acts of 1944, 1946, and 1950 is $92,782,900. The latest estimate, based on 1949 prices, is $152,094,700, an increase of 64

percent. Because of characteristics of that program more fully discussed in a separate report, no further consideration is given at this point.

CONSTRUCTION COST RISES

In large measure the rise in cost is due to the general inflation which has not only countereffected savings made possible by improved methods of construction, but has resulted in large net increases in dollar estimates. The Engineering News-Record construction cost index has varied as follows over the past 20 years:

Year:	*ENR index*	Year:	*ENR index*
1931	181. 35	1946	345. 98
1934	198. 10	1947	413. 24
1935	196. 44	1948	460. 72
1936	206. 42	1949	477. 02
1940	241. 96	1950	509. 37
1941	257. 84	1951	542. 00
1944	298. 72	December 1951	547. 67
1945	307. 75	December 1952	587. 49

Percentage increases:	*Percent*	Percentage increases:	*Percent*
1936–51	167. 5	1946–51	59. 6
1941–51	114. 1	1948–51	19. 8
1944–51	84. 6	1950–51	8. 3

It is to be noted that the ENR construction cost index is not necessarily an accurate measure of cost increases for any particular project. The index is based on costs in 21 cities of 25 hundredweight structural steel shapes, base mill price; 6 barrels portland cement, bulk; 1,088 M feet boardmeasure 2 by 4, surfaced four sides, lumber; and 200 hours, common labor; at local prices.

The ENR building cost index is similar except that 68.38 hours skilled labor is used in lieu of common labor.

These indexes reflect wage rate and material price trends. They do not adjust for labor or job efficiency, materials, availability, competitive conditions, management, mechanization or other "intangibles" affecting construction costs.

The Engineering News-Record states that both indexes have proved, over the years infallible as to direction and, in normal times, accurate as to degree.

The comparison of Corps of Engineers and Bureau of Reclamation figures with those submitted by Tennessee Valley Authority might indicate that some radical difference between the authority and the departmental agencies could account for the apparent difference in accuracy of estimates. Upon closer examination, as shown in the foregoing, such a conclusion does not appear to be warranted.

It would appear rather that no agency has been able to estimate with any degree of accuracy so that it can provide for price changes such as have occurred in the past 15 years. Secondly, it would appear that estimates based on preliminary studies are inadequate because of their general preliminary nature, because of the changes in design being made in light of accumulated experience, and because of the broader development of projects when constructed as compared with their original conception when authorized.

It follows that preliminary estimates of cost do not provide an adequate basis upon which to make a conclusive benefit-cost evaluation of economic justification. Preliminary estimates, if properly

made, can give some measure of magnitude of works, presumably the best available at the time they are made. However, firm decisions concerning the economic merit of development of projects should await the availability of firmer plans and more reliable estimates of both costs and benefits.

Costs During Construction

Another phase of the cost problem can be illustrated by reference to a few selected projects. In this tabulation estimated costs are shown as they were reported in the original survey used as the basis for authorization, as reported to Congress the fiscal year following the first availability of planning funds, as reported to Congress in the first fiscal year following the availability of construction funds, and as estimated for the budget for fiscal year 1953.

Table 6.—*Changing cost estimates of selected projects*

Project	Survey report	After planning funds	After first construction funds	Fiscal year 1953
Buggs Island Reservoir, N. C	$31,730,000	$57,730,000	$68,900,000	$84,860,000
McNary Dam, Oreg	49,470,000	130,735,000	227,028,000	281,650,000
Dalles Dam, Oreg	286,366,000	326,366,000	348,372,000	348,372,000
Garrison Reservoir, N. Dak	130,000,000	158,000,000	177,000,000	278,195,000
Fort Randall Reservoir, S. Dak	75,000,000	133,132,000	160,000,000	197,300,000
Oahe Reservoir, S. Dak	72,800,000	158,000,000	245,900,000	285,500,000
Chief Joseph Dam, Wash	104,000,000	206,000,000	206,000,000	206,000,000

The changes in cost reflect all the elements reported in table 5 but result primarily from price rises and changes in concept of the project either as specifically authorized or as developed under administrative authority.

The changes in the McNary Dam project are set forth in detail on pages 34 to 38 of the hearings. This project as originally conceived contemplated a pool elevation 310.5 feet above sea level, the installation of 385,000 kilowatts of electric generating capacity and a navigation lock 56 by 360 feet. When authorized in 1945, the legislation specifically provided that the pool elevation be 340 feet above sea level if feasible and that provision be included for the protection of anadromous fishes. Further study indicated the desirability of increasing the length of the lock from 360 to 500 feet and of increasing the installed generating capacity to 690,000 kilowatts. The hydro capacity was later increased to 966,000 kilowatts and the size of the navigation lock to 86 by 675 feet. Some of the changes from the original concept of the project were specifically provided in the authorizing legislation. Other changes do not appear to have been so specifically authorized. However, the characteristics of the project as presently conceived were presented to Congress in House Document 531, Eighty-first Congress, which served as a basis for the authorization of additional projects in the Columbia River. Even though the project at its present dimensions may not bave been specifically authorized, no objection was raised to the revisions when the Columbia River Basin report was considered in the drafting of the 1950 River and Harbor and Flood Control Act. Apparently the revisions were not actively considered but the law can be interpreted as approving them.

The three Missouri River Basin projects, shown in the tabulation of selected projects, were authorized by the Flood Control Act of 1944, but the recommendations of the Chief of Engineers in the basic plan (H. Doc. 475, 78th Cong.) proposed the works "with such modifications thereof and changes therein as the Secretary of War and Chief of Engineers may from time to time find advisable."

It appears that changes in cost estimates such as those set forth in the tabulation prompted a paragraph in the budget message for 1953 in which the President said:

> Because of the large increases in costs that have been experienced on some projects I have asked the Director of the Bureau of the Budget to prepare for the consideration of the Congress, appropriation language which would require further congressional approval before work could go forward where the total cost of the authorized improvement has increased by more than 10 percent above the last estimate approved by the Congress, after allowance for changes in construction cost levels. This will permit a reappraisal to be made to determine whether we would be justified in proceeding with the work.

The subcommittee knows of no procedure that, under existing economic conditions, would avoid marked increases in cost between the time of the survey for authorization and the time construction is initiated nor for anticipating the price rises between the time construction is initiated and the time it is completed. It does believe that the changes in estimates of the Corps of Engineers' projects listed in table 6 reflect adversely upon the care in preparing cost figures and firmess of plans presented to Congress. A properly competent organization would quickly correct these deficiencies.

The subcommittee has recommendations for the better control of cost increases resulting from reasons other than price rise and these are set forth subsequently in the report.

Project Modifications

The analysis of cost increases made by the Corps of Engineers shows that 57.8 percent were due to price changes, 17.6 percent due to changes in project scope as specifically authorized by law, and 24.6 percent for other reasons. While the other reasons are set forth by name, they can be lumped into a single category called administrative modifications.

The rivers and harbors and flood-control acts usually have authorized projects—

> in accordance with the plans and subject to the conditions recommended by the Chief of Engineers in the respective reports hereinafter designated * * *.

The reports are listed by name and document number in such manner as in effect write into law the engineering and policy recommendations of the Chief of Engineers. Most of the recommendations of the Chief of Engineers contain language of this general order:

> Substantially in accordance with the plans presented in the accompanying report of the district engineer, with such modifications thereof as in the discretion of the Chief of Engineers may be advisable.

The Flood Control Act of 1938 authorized several basin plans as described in Flood Control Committee Document No. 1, Seventy-fifth Congress, first session—

> with such modifications thereof as in the discretion of the Secretary of War and the Chief of Engineers may be advisable * * *, the reservoir and local protection projects to be selected and approved by the Chief of Engineers.

Your subcommittee is firmly of the opinion that the administrative officer responsible for water resource project construction must have some latitude in execution because authorizations are not made on the basis of final working plans, and, of course, all contingencies cannot be foreseen. However, there is a question as to the magnitude of a modification which an administrative officer should be authorized to make without specific congressional authority to make a change.

The Chief of Engineers in his testimony agreed that it was desirable for the administrative agency to return to Congress for additional specific authority when major changes were contemplated. As already pointed out the Corps of Engineers says the authorized plan may not be modified without additional authorization by Congress.

It is to be noted that in the McNary Dam project, the lock dimensions have been changed from the 56 by 360 feet to 86 by 675 feet, and that the power installation has been changed from the 385,000 kilowatts contemplated in the authorized plan to 966,000 kilowatts.

The Flood Control Act of 1946 and subsequent flood-control acts include the following language:

> It is hereby declared to be the policy of the Congress that the following provisions shall be observed: No project or any modification not authorized of a project for flood control or rivers and harbors shall be authorized by the Congress unless a report for such project or modification has been previously submitted by the Chief of Engineers, United States Army, in conformity with existing law.

It would appear that the intent of Congress is that the Chief of Engineers may make minor modifications but clearly may not make major changes in a project without congressional action based upon a formal report.

An example of the latitude presently exercised is illustrative. The Flood Control Act of 1938 adopted a program for the Missouri River Basin. This authorization referred to a specific document (Flood Control Committee Doc. No. 1, 75th Cong.), in which the Chief of Engineers recommended a series of seven reservoirs in the Missouri River Basin. One of these, Milford, was proposed to be located on the Republican River in Kansas.

In 1940 the Chief of Engineers, in response to proper authorization, submitted a report on the Republican River (H. Doc. 842, 76th Cong.). In this report he found that a reservoir on the Republican River in Harlan County, Nebr., as a substitute for the Milford Reservoir, would provide protection for a large area in the Republican Valley without materially affecting its value for controlling Kansas River and Missouri River floods. He stated:

> A change in the location of the reservoir can be made under authority contained in the 1938 Flood Control Act.

He made no recommendations but reported that other than the construction of the reservoir under the approved general comprehensive plan for flood control and other purposes in the Missouri River Basin at the Harlan County site instead of at the Milford site, no improvements either for flood control or for flood control in combination with irrigation and power development were justified. The tenor of the report indicated that the inclusion of irrigation storage in the reservoir would decrease its economic value. While no congressional action was recommended in his report, the Flood Control Act of 1941 modified the 1938 authorization to include the Harlan County Reser-

voir recommended by the Chief of Engineers and "such other supplemental flood-control works on the Republican River as the Secretary of War and the Chief of Engineers may find advisable."

It would appear to this point that the legislation and the reports contemplated a flood-control reservoir on the Republican River at the Harlan County site. Irrigation storage had been considered and rejected by the Army engineers as not economically feasible. It was certainly not specifically authorized in law.

In February 1944, the Secretary of War submitted a report on the Missouri River Basin (H. Doc. 475, 78th Cong.) to Congress recommending major flood-control improvements for the Missouri River. On page 30 of that report is a table No. 2 headed "Projects now authorized." Among the projects authorized was listed Harlan County Reservoir at an estimated total cost of $20,000,000. A footnote to the cost figure reads:

> Current estimate (including storage for irrigation), $31,000,000.

The recommendations in the document were adopted by the Flood Control Act of 1944. In these the Chief of Engineers recommended modification of the general comprehensive plan substantially in accordance with the plans of the division engineer for flood control, irrigation, power development, navigation, and other purposes, with such modifications thereof and changes therein as the Secretary of War and Chief of Engineers may from time to time find advisable.

Paragraph 89 of the district engineer's report in House Document 642, Eighty-first Congress, Kansas River and tributaries, now pending before the Committee on Public Works, lists as one of the authorized reservoirs in the Republican River Basin that designated under the name "Harlan County" for which the characteristics include storage allocations of 500,000 acre-feet for flood control, 150,000 acre-feet for irrigation, and 200,000 acre-feet for conservation and silting, a total of 850,000 acre-feet. (This capacity should be compared in passing with the recommendation of the district engineer in H. Doc. 842, 76th Cong., that Harlan County Reservoir be constructed as a flood-control project with a storage capacity of at least 1,008,000 acre-feet.) It would appear then that without specific legislative action, the flood-control storage at Harlan County Reservoir has been greatly reduced below that contemplated in the authorization and irrigation storage has been provided without specific authorization.

The subcommittee does not question, at this point, the desirability of changing the reservoir capacity for flood control or adding provision for irrigation. The question is one of proper extent of delegation to make project modifications. The example does not appear consistent with contentions made to the subcommittee by the Corps of Engineers that an authorized project is not modified without specific approval of Congress.

Basin Authorizations

The approved project for control of the lower Mississippi River was the first basin type authorization for the Corps of Engineers. While originally the project was considered in a bill exclusively concerned with it, in recent years modifications have been included in general flood-control legislation. Since its original authorization in 1928,

there has been a limitation on the total authorized appropriation for the project. A summary of its growth and prosecution is shown in tables 7, 8, and 9.

TABLE 7.—*Flood control, Mississippi River and tributaries—Total authorizations by acts*

Act and feature	Document	Amount
Public Law 391, 70th Cong., May 15, 1928 (Jadwin plan)	H. Doc. 90, 70th Cong	$325,000,000
Public Law 678, 74th Cong., June 15, 1936	Flood Control Committee 1, 74th Cong.	272,000,000
Public Law 761, 75th Cong., June 28, 1938	Flood Control Committee 1, 75th Cong.	40,000,000
Public Law 228, 77th Cong., Aug. 18, 1941:		
Yazoo backwater levee	H. Doc. 359, 77th Cong	11,982,000
Red River backwater	do	14,000,000
Bayous Rapides, Boeuf and Cocodrie	None	0
Modifications of St. Francis Basin plan	do	0
		25,982,000
Public Law 534, 78th Cong., Dec. 22, 1944:		
Boeuf, Tensas, and Macon [1]	H. Doc. 151, 78th Cong	5,013,000
Sunflower, Hushpuckena, etc.[1]	H. Doc. 516, 78th Cong	3,752,000
Yazoo backwater	None	1,952,000
Stabilization and 12-foot channel	H. Doc. 509, 78th Cong	200,000,000
		201,952,000
Public Law 526, 79th Cong., July 24, 1946:		
Boeuf, Tensas, and Macon, La.[2]	H. Doc. 151, 78th Cong	5,013,000
Bayou La Fourche, La	S. Doc. 191, 79th Cong	5,913,000
Boeuf, Tensas, and Macon, Ark	None	4,930,000
Big and Little Sunflower, etc., Mississippi [2]	H. Doc. 516, 78th Cong	3,752,000
Extension of Sunflower, etc., Mississippi	None	2,500,000
Extension of Yazoo headwater project, Mississippi	do	7,500,000
McKinney Bayou, Miss	do	300,000
Bayou des Glaises, La.[2]	H. Doc. 378, 74th Cong	(3)
North bank Arkansas levee, Arkansas	H. Doc. 308, 74th Cong	(3)
Augusta to Clarendon, Ark	H. Doc. 98, 76th Cong	2,847,500
Tiptonville-Obion levee, Tennessee	H. Doc. 188, 72d Cong	(3)
Extension of Tiptonville levee, Tennessee	H. Doc. 757, 79th Cong	6,000,000
St. Johns Bayou levee, Missouri	H. Doc. 138, 79th Cong	1,300,000
Memphis Harbor, Tenn	S. Doc. 51, 80th Cong	17,120,000
Vicksburg-Yazoo area, Mississippi	None	4,000,000
Modification of main line levees	do	500,000
Increased costs lower Mississippi River	do	100,000,000
		161,675,500
Public Law 858, 80th Cong., June 30, 1948:		
West Tennessee tributaries	H. Doc. 627, 80th Cong	7,700,000
Devils Swamp Channel	H. Doc. 321, 80th Cong	2,000,000
L'Anguille River (partial)	H. Doc. 651, 80th Cong	2,000,000
Total		11,700,000
Public Law 516, 81st Cong., May 17, 1950:		
Red River backwater increase	None	15,000,000
St. Francis River Basin (partial)	H. Doc. 132, 81st Cong	20,000,000
Cache River Basin (partial)	S. Doc. 88, 81st Cong	10,000,000
Orleans Parish levees	None	(3)
Grants Canal	do	11,000
Des Arc, Ark	H. Doc. 485, 81st Cong	228,000
Lake Pontchartrain levee	S. Doc. 139, 81st Cong	3,150,000
Amite River Bank protection	None	50,000
Grand Prarie-Bayou Meto (partial)	H. Doc. 255, 81st Cong	6,000,000
Increased costs of construction	None	200,000,000
		254,439,000
Grand total authorization		1,292,748,500

[1] In 1944 these 2 items were considered "Flood control, general" and the authorization was not included in "Flood control, Mississippi River and tributaries."
[2] Items previously authorized under "Flood control, general" legislation.
[3] Maintenance only.

NOTE.—In addition to the foregoing specific authorizations the following acts have been enacted by the Congress to facilitate the administration of the project:
1. Public Law 395, 71st Cong. (46 Stat. 787)—amends sec. 7 of Public Law 391, 70th Cong.
2. Public Law 351, 72d Cong. (47 Stat. 810)—administration of lands in Bonnet Carre Spillway.
3. Public Law 171, 73d Cong. (48 Stat. 607)—reimbursement for rights-of-way.

Basin authorizations in the general flood-control program were initiated in 1938. Since that time 18 basin plans for flood control have been approved and two others have been adopted in rivers and harbors acts.

While individual project authorizations usually are quite definitive of the characteristics of a project, the basin authorizations are extremely general. The Chief of Engineers in operating under the latter has great latitude in determining specific location, size, and secondary purposes of the various projects. Mention has already been made of the interpretation of the 1938 basin authorization for the Missouri River as being adequate to permit a change of site for a reservoir on the Republican River, Kans., from Milford, as indicated in the project document, to the Harlan County location where the structure has been built. It is true in this instance that the Harlan County Reservoir was specifically authorized by law, but the point being made here is that the interpretation of the original authorization of the Chief of Engineers was that by administrative decision alone he could have substituted the Harlan County site for the Milford site.

Characteristics of these authorizations are exemplified by that adopted for the Ohio River Basin.

TABLE 8.—*Flood control, Mississippi River and tributaries—Appropriations made to date from the $1,292,748,500 authorized by the Flood Control Act of May 15, 1928, as amended by the acts of June 15, 1936; June 28, 1938; Aug. 18, 1941; Dec. 22, 1944; July 24, 1946; June 30, 1948; and May 17, 1950*

	Total appropriation	Maintenance expenditures
May 28, 1928 (Second Deficiency Appropriation Act)	$14,000,000	[1]
Feb. 28, 1929 (War Department Appropriation Act, fiscal year 1930)	30,000,000	
May 28, 1930 (War Department Appropriation Act, fiscal year 1931)	35,000,000	
Dec. 20, 1930 (Emergency Construction Act)	3,000,000	
Feb. 23, 1931 (War Department Appropriation Act, fiscal year 1932)	35,000,000	
July 14, 1932 (War Department Appropriation Act, fiscal year 1933)	32,000,000	
July 21, 1932 (Emergency Relief and Construction Act)	15,500,000	
Mar. 4, 1933 (War Department Appropriation Act, fiscal year 1934)	19,653,424	
NRA (amounts allotted by PWA, fiscal year 1934)	44,000,000	
Apr. 26, 1934 (War Department Appropriation Act, fiscal year 1935)	29,000,000	
Apr. 9, 1935 (War Department Appropriation Act, fiscal year 1936)	15,000,000	
May 15, 1936 (War Department Appropriation Act, fiscal year 1937)	15,000,000	
May 28, 1937 (Second Deficiency Act)	1,000,000	
July 19, 1937 (Emergency Relief Appropriation Act of 1937)	2,000,000	
July 19, 1937 (Civil Appropriation Act, fiscal year 1938)	30,000,000	
June 11, 1938 (Civil Appropriation Act, fiscal year 1939)	31,000,000	
June 28, 1939 (Civil Appropriation Act, fiscal year 1940)	39,000,000	
June 24, 1940 (Civil Appropriation Act, fiscal year 1941)	30,000,000	
May 23, 1941 (Civil Appropriation Act, fiscal year 1942)	22,000,000	$6,646,854
Apr. 28, 1942 (Civil Appropriation Act, fiscal year 1943)	29,954,000	13,044,694
June 2, 1943 (Civil Appropriation Act, fiscal year 1944)	14,000,000	10,253,888
Dec. 23, 1943 (First Supplemental National Defense Act)	5,000,000	
June 26, 1944 (Civil Appropriation Act, fiscal year 1945)	26,000,000	9,782,780
Mar. 31, 1945 (Civil Appropriation Act, fiscal year 1946)	30,000,000	10,534,342
First Deficiency Appropriation Act, 1946	15,000,000	
May 2, 1946 (Civil Appropriation Act, fiscal year 1947)	46,000,000	14,311,685
July 31, 1947 (Civil Appropriation Act, fiscal year 1948)	50,000,000	13,507,653
June 25, 1948 (Civil Appropriation Act, fiscal year 1949)	61,000,000	17,080,676
Oct. 13, 1949 (Civil Appropriation Act, fiscal year 1950)	67,000,000	15,790,282
Sept. 6, 1950 (Appropriation Act, fiscal year 1951)	61,400,400	13,088,747
Oct. 24, 1951 (Appropriation Act, fiscal year 1952)	60,500,000	14,506,000
July 11, 1952 (Appropriation Act, fiscal year 1953)	60,020,000	15,695,374
	968,027,824	154,236,975

[1] The Flood Control Act approved Aug. 18, 1941, contained in subpar. (g) under the title "Lower Mississippi River" the following proviso: "*Provided*, That funds hereafter expended for maintenance shall not be considered as reducing present remaining balances of authorizations."

Total authorizations	$1,292,748,500
Appropriations minus maintenance	813,790,849
Remaining to be appropriated after fiscal year 1953	478,957,651

TABLE 9.—*Flood control, Mississippi River and tributaries, status*

Item of work	Total estimated Federal cost	Total amount appropriated to date (through fiscal year 1953)	Balance to complete
CONSTRUCTION			
Main stem, Mississppi River:			
Mississippi River levees	$271,000,000	$205,639,769	$65,360,231
Bank-stabilization work	356,000,000	216,700,705	139,299,295
Dredging	103,298,056	86,533,685	16,764,371
Mapping	4,863,000	3,474,325	1,388,675
Memphis Harbor	21,600,000	8,745,000	12,855,000
Devils Swamp	2,500,000	0	2,500,000
Morganza structure	20,680,000	19,820,000	860,000
Completed items of work	23,195,839	23,195,839	0
Subtotal	803,136,895	564,109,323	239,027,572
OFF-MAIN-STEM WORK			
St. Francis Basin	44,826,000	17,305,517	27,520,483
West Tennessee tributaries	7,700,000	0	7,700,000
Lower White River	13,110,000	7,997,138	5,112,862
Cache River Basin	10,000,000	0	10,000,000
L'Anguille River	2,000,000	0	2,000,000
Grand Prairie-Bayou Meto Basin	6,000,000	0	6,000,000
Lower Arkansas River:			
North bank	11,910,000	3,324,865	8,585,135
South bank	17,340,000	12,822,585	4,517,415
Yazoo River Basin:			
Reservoirs	74,898,000	67,912,161	6,985,839
Local protection	99,102,000	10,355,740	88,746,260
Big Sunflower	7,500,000	403,000	7,097,000
Tensas River Basin:			
Boeuf and Tensas	20,770,000	7,135,000	13,635,000
Red River Backwater	29,000,000	6,025,313	22,974,687
Grants Canal	11,000	0	11,000
Lower Red River	10,360,000	8,467,647	1,892,353
Atchafalaya River Basin:			
Levees and structures	124,830,000	101,781,141	23,048,859
Bayou Rapides, Boeuf, and Cocodrie	4,290,000	3,386,814	903,186
Lake Pontchartrain	3,150,000	0	3,150,000
Amite River	50,000	0	50,000
Completed items of work	2,764,605	2,764,605	0
Subtotal	489,611,605	249,681,526	239,930,079
Grand total	1,292,748,500	813,790,849	478,957,651

THE OHIO RIVER BASIN

The Federal flood-control program authorized for the Ohio River Basin consists of a general comprehensive plan of reservoirs and local flood-protection works which was approved by Congress with limited monetary authorizations for appropriation of funds, together with a number of other projects which were authorized by name separately from the general plan. The Chief of Engineers has authority to select projects from those included in the general plan for initiation and accomplishment with funds appropriated for the work.

The steps by which this flood-control work has been authorized by Congress are as follows:

(*a*) The Tygart Reservoir, which was initiated in 1934 with PWA funds as an emergency relief project, was authorized by Congress in the River and Harbor Act of 1935. This project, although authorized separately, is functionally a part of the reservoir system above Pittsburgh and of the general comprehensive Ohio Basin plan but due to its authorization under a River and Harbor Act has not been

carried as a part of the monetary authorization for the general comprehensive basin plan subsequently authorized under flood-control law.

(*b*) The Flood Control Act of 1936 (Public Law 738, 74th Cong.) authorized a reservoir system for the protection of Pittsburgh and a reservoir system for the reduction of Ohio River floods below Pittsburgh, both generally as set forth in House Document 306, 74th Congress. Public Law 51, Seventy-fifth Congress, modified this authorization with respect to the reservoirs above Pittsburgh to provide for such "provisions or modifications as may be found advisable by the Chief of Engineers upon further investigation." The authorizing act of 1936 (Public Law 738) gives a total estimated cost for the two groups of reservoirs of $40,262,800 for construction and $45,088,600 for lands and damages. Thus the law authorizes construction of these projects and merely gives an estimated cost at time of authorization.

(*c*) After the great Ohio River flood of 1937, the Committee on Flood Control of the House of Representatives by resolution of February 10, 1937, requested the Chief of Engineers to review reports and submit "at the earliest practicable date revised comprehensive plans for protective works against floods in the Ohio Valley * * *." In compliance the Chief of Engineers submitted his report dated April 6, 1947, which was published as Flood Control Committee Document 1, Seventy-fifth Congress. This report presented a general plan composed of the 29 reservoirs previously authorized by Congress supplemented by 45 others, located on major tributaries of the Ohio. In addition, the report pointed out that adequate flood protection could not be provided by reservoirs only and proposed local works for the protection of cities and towns. The President, in transmitting this report to the House Committee on Flood Control on April 28, 1937, pointed out the absence of coordination with other agencies of the Government and requested that consideration of the report be delayed until the next session of Congress. Subsequently the President is reported to have recommended to the committee an amendment of the 1936 act for authorization of $24,877,000 for levees, flood walls, and drainage structures, in accordance with the report of the Chief of Engineers. The Flood Control Act of 1937 (Public Law 406, 75th Cong.) carries such an authorization with the provision that "the projects to be selected by the Chief of Engineers * * *." The act of 1937 also provides that if in the execution of the project for reservoirs above Pittsburgh it is not found practicable to construct a reservoir that would protect Johnstown, Pa., flood protection for that city should be provided by channel enlargement or other works.

(*d*) The Flood Control Act of 1938 provides that the general comprehensive plan for flood control and other purposes in the Ohio River Basin, as set forth in Flood Control Committee Document 1, Seventy-fifth Congress, with "such modifications thereof as in the discretion of the Secretary of War and Chief of Engineers may be advisable" is approved. The legislation further provides that the reservoirs and local protection projects are to be selected and approved by the Chief of Engineers. The bill authorized the appropriation of a total of $125,300,000.

This general comprehensive plan included as an integral part the reservoirs previously authorized in the act of 1936 and the local protection works authorized in the act of 1937. These have been subsequently considered by the Corps of Engineers as a part of that plan and not as a separate authorization, as they were actually a part of the general plan approved by the act of 1938. In reporting on the bill, the Flood Control Committee stated:

> The selection of the projects is left to the Chief of Engineers. It is contemplated that priority projects will have first consideration.

The committee document in question listed 74 reservoirs within the Ohio River Basin. The recommendation of the Chief of Engineers was for the construction of a system of 45 flood-control reservoirs on the tributaries of the Ohio River in addition to those already authorized. The reservoirs are specified by name in the document, and a general location, as proposed at that time, is shown on a map included.

The proposed plan, was reported by the Committee on Flood Control on May 13, 1938, in House Report 2353 of the Seventy-fifth Congress. By that time the Corps of Engineers had developed a more comprehensive flood-control plan providing for a system of 49 reservoirs on tributaries of the Ohio in addition to those previously authorized. It was also considered that some 235 levees and floodwall projects would be needed for complete protection of the principal damage centers in the basin. The House report included a list of reservoirs and a list of the local flood-protection works that appeared most necessary and desirable at that time. While this list was not so identified, it was obviously a summary of items considered in the comprehensive flood control plan the Corps of Engineers had developed in the years since the flood of January 1937. The enacting legislation made no reference to the lists but referred back to the April 1937 report. The clause added in the legislation by the committee reading:

> with such modifications thereof as in the discretion of the Secretary of War and Chief of Engineers may be advisable—

and the second clause—

> the reservoirs and local protection projects to be selected and approved by the Chief of Engineers—

have been considered to give the Chief of Engineers authority to build such projects under the flood-control plan as may have been included in the plan presented in the April 1937 report, Committee Document 1, Seventy-fifth Congress, and such projects as were listed in House Report 2353.

(*e*) The Flood Control Act of 1939 provided that the general comprehensive plan approved by the act of 1938 should include the reservoirs of the Muskingum River Basin which had been placed under construction for the Muskingum Watershed Conservancy District by the Corps of Engineers with ERA funds.

(*f*) Subsequent flood-control legislation has carried additional monetary authorizations of funds to be appropriated for prosecution of the general comprehensive plan and have authorized separately a number of additional local flood-protection works.

The monetary authorizations which have been made in the various flood-control acts for prosecution of the general comprehensive plan for the Ohio Basin are:

Flood-control acts:	*Monetary authorization*	Flood-control acts—Con.	*Monetary authorization*
1936	$168, 139, 000	1944	70, 000, 000
1937	24, 877, 000	1946	125, 000, 000
1938	125, 300, 000	1950	100, 000, 000
1941	45, 000, 000		

The Corps of Engineers considers that, since the 1936 act authorized the reservoirs above and below Pittsburgh at certain estimated costs, it is appropriate to include the current estimated costs of these reservoirs as a part of the monetary authorization.

In arriving at the monetary authorization provided by the 1936 act, however, the Corps of Engineers has included the current costs of only those projects complete or under construction and has included original estimate for the others.

Prior to consideration by Congress of the Flood Control Act of 1938, the Chief of Engineers had supplemented the studies which led to submission of the general comprehensive plan for the Ohio (Committee Doc. 1, 75th Cong.), and the latest plans and estimates were made available to the Flood Control Committee of the House of Representatives and were utilized by it when legislation giving approval to the plan was framed. It is believed by the Corps of Engineers, therefore, that these estimates made available to the committee in the spring of 1938 may properly be considered generally as the estimates upon which authorization of the comprehensive plan was based.

Table 10, supplied by the Corps of Engineers, summarizes the original estimates and compares them with current estimates based on 1951 price levels.

TABLE 10.—*Summary of Ohio River Basin flood-control program*

	Original estimate	Current estimate
A. COMPREHENSIVE PLAN		
1. Reservoirs (14) authorized above and below Pittsburgh by act of 1936 which are a part of general plan	$127, 020, 000	$316, 644, 000
2. Muskingum Basin reservoirs included in plan by act of 1939	38, 320, 000	40, 673, 000
3. Reservoirs (48) and local flood-protection works (235) added by approval of general comprehensive plan by act of 1938	544, 021, 000	1, 276, 062, 000
Total for comprehensive plan	709, 361, 000	1, 633, 379, 000
B. PROJECTS AUTHORIZED SEPARATELY		
1. Tygart Reservoir	12, 000, 000	18, 432, 000
2. Projects (22) authorized by act of 1936	12, 870, 000	45, 809, 000
3. Projects (2) authorized by 1941 act	13, 674, 000	24, 813, 000
4. Projects (2) authorized by 1948 act	1, 615, 000	1, 909, 000
5. Projects (4) authorized by 1950 act	8, 501, 000	11, 023, 000
Total of separate authorization	48, 660, 000	101, 986, 000
Grand total	758, 021, 000	1, 735, 365, 000

The following facts should be noted regarding the increase in costs shown by the foregoing comparison:

(*a*) The original cost estimates for the reservoirs above and below Pittsburgh and for the works comprising the general comprehensive plan, except the Muskingum, were prepared in 1937 on the basis of price levels prevailing at that time. The ENR construction cost index stood at 234.71 in 1937 and had risen to 542.36 by July 1951, the time of current estimates given above. Thus construction costs rose about 2.3 times during the period.

(*b*) The largest cost increases are shown by the projects authorized separately in the act of 1936. Authorization of these projects was based on 308 report estimates.

The over-all status of the flood-control program for the Ohio River Basin may be summarized as follows:

	Present estimated cost	Appropriations through fiscal year 1952
(*a*) General comprehensive plan:		
Projects complete or under construction	$544,987,000	$464,956,000
Projects not started	1,088,392,000	3,521,000
Total	1,633,379,000	468,477,000
(*b*) Projects authorized separately:		
Projects complete or under construction	32,422,060	24,831,000
Projects not started	69,564,000	314,000
	101,986,000	25,145,000
Grand total	1,735,365,000	493,622,000

At the present time the total monetary authorization, or amount which Congress has authorized to be appropriated for carrying out the general comprehensive plan for the Ohio Basin is $658,316,000. This is in excess of the $468,477,000 which has been appropriated for construction and for planning in carrying out the general plan.

The absence of precision in authorization is noteworthy.

The foregoing discussion has referred to the number of reservoirs authorized by the 1938 act as, according to Flood Control Committee Document No. 1, Seventy-fifth Congress, 45 in addition to 29 previously authorized and as 49 according to the list in House Report 2353, Seventy-fifth Congress. A check of the annual report of the Chief of Engineers for 1950 shows a total of 90 now considered to be authorized. Of these 28 were named both in Flood Control Committee Document No. 1, Seventy-fifth Congress, and House Report 2353, Seventy-fifth Congress; 27 solely in the committee document and 18 solely in the committee report. Three others were authorized in accordance with recommendations in separate specific documents and 4 (including one on which no further work is contemplated) now considered by the Corps of Engineers to be authorized, were not named in any document or authorization.

A review of the levee and wall projects is not so readily possible. Flood Control Committee Document No. 1, Seventy-fifth Congress, stated that such projects would be necessary at 155 localities. House Report 2353, Seventy-fifth Congress, stated that such works would be needed at 235 localities, but named only 92. The annual report now lists 219 which it can only be presumed from the published record were among the original 235 or were specifically added by later legislation.

The subcommittee notes that while a more or less blanket authorization may have been necessary in 1938 in order to get started an urgently needed program, the expansion of that program without review by the Committee on Public Works is of doubtful necessity. No detailed examination of the economic merit of the projects has been made by the committee and, of course, none has been made generally available in a public document. For example, the annual report of the Chief of Engineers lists as an authorized reservoir one

designated as Moores Ferry, on the New River, Va., estimated to cost over $40,000,000. Nothing is shown as to purposes in addition to flood control which may be contemplated and nothing as to its benefits has been placed before the committee. The subcommittee is at a loss to explain how this project could have been legally selected by the Chief of Engineers even with the great latitude provided for the Ohio River Basin program.

The subcommittee is of the opinion that such works selected by the Chief of Engineers under existing authority should not now be initiated without further review and approval by the Public Works Committee. The inconsistency of requiring detailed reports for new authorizations in some parts of the country and the continuance of this general type of authorization for other parts should be obvious. The present large backlog of authorizations places upon the committee a responsibility for additional review. The executive agency should have broad latitude for program review and revision, but legislative authority should be consistently retained by the legislative body.

SUMMARY OF BASIN AUTHORIZATIONS

A summary of the status of the basin authorizations is shown in table 11. It is to be noted from column 7 of the table that in no instance thus far have funds been appropriated in excess of the total

TABLE 11.—*Status of basin authorizations*

[In millions of dollars]

Basin	Present estimated cost (1951)	Total monetary authorization (through act 1950)	Estimated cost of work started through fiscal year 1952	Appropriations through fiscal year 1952 [1]	Relation of monetary authorizations to—	
					Work started	Funds appropriated
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Flood control:						
Connecticut	156.6	73.0	33.4	33.0	39.6	39.6
Merrimack	31.8	24.2	12.3	12.3	11.9	11.9
Thames	36.6	13.2	8.7	8.0	4.5	5.2
Savannah	77.5	50.0			50.0	50.0
Central and southern Florida	68.9	36.3	68.9	13.8	−32.6	22.5
Arkansas	495.8	279.7	108.9	100.9	170.8	178.8
White	256.1	169.0	114.9	111.5	54.1	57.5
Upper Mississippi	303.3	44.3	39.2	20.6	5.1	23.7
Ohio	1,541.1	658.3	489.5	410.3	168.8	248.0
Missouri [2]	1,443.5	616.0	1,022.2	378.7	−406.2	237.3
South Platte	58.2	26.3			26.3	26.3
Kaweah and Tule	26.4	4.6			4.6	4.6
San Joaquin	59.7	8.0	8.0	5.0		3.0
Sacramento	111.1	18.5	30.0	1.8	−11.5	16.6
Los Angeles	347.8	197.5	347.8	124.9	−150.2	72.7
Santa Ana	53.2	35.5	19.7	19.1	15.8	16.4
Columbia	1,830.7	192.3	195.1	128.6	−2.8	63.7
Ouachita	42.0	21.3			21.3	21.3
	6,940.3	2,468.0	2,498.6	1,368.5	−30.5	1,099.1
Rivers and harbors:						
Arkansas	798.3	69.8	119.5	6.6	−49.6	63.2
Alabama-Coosa	193.3	60.0			60.0	60.0
	991.6	129.8	119.5	6.6	10.4	123.2
Total	7,931.9	2,597.8	2,618.1	1,375.1	−20.1	1,222.3

[1] Exclusive of small amounts of unallotted planning funds.

[2] The Flood Control Act of 1944 also approved a program in the Missouri River Basin for prosecution by the Bureau of Reclamation. The overcommitment by this Bureau appears to be at least $55,000,000.

monetary authorization. It is to be more carefully noted that on six of the projects the present estimated cost of work started is in excess of the total amount authorized to be appropriated.

It has been the procedure of the Chief of Engineers, in carrying out works involved in these basin authorizations, to justify before the Bureau of the Budget and the Committees on Appropriations the proposed initiation and continuation of specific items. It is believed correct to say that the Corps of Engineers has not started work on or applied funds to any project which has not been presented to the Committee on Appropriations. It would appear then that the present overcommitments have been made with the full knowledge of reviewing bodies of the executive branch and of the Committee on Appropriations. The question of appropriating funds in excess of the legal monetary authorization in order to meet these overcommitments has not yet arisen. Doubtless the Committee on Public Works will be requested to propose legislation providing increased authorizations so that the question of appropriating funds in excess of the authorizations may never arise. While the situation is possible, it seems completely unrealistic to anticipate that the Committee on Public Works would at any time insist upon holding to monetary authorizations it had approved with the result that work would be discontinued on some large structure which was only partially completed. It is clear that, with overcommitments of the magnitude shown in the table, the projects now under way cannot be completed within the authorized appropriations. Even though there may be no violation of the letter of the law, the action of the Corps of Engineers and of the Bureau of Reclamation appears to constitute a breach of faith with the Congress.

Planning

Frequently the results of an effort are considerably different from the original intent. This, it appears, is true of that phase of rivers and harbors and flood-control activities now characterized as planning.

Until relatively recent years there was no separate phase of a civil-works program of the Corps of Engineers designated as planning. Preliminary examinations and surveys were made; and, upon the completion of reports thereon, that phase of the work was terminated. On the basis of these reports, projects were authorized; and the next phase of work, at least so far as financing was concerned, was construction. The basic element in the construction phase was the preparation of engineering plans and specifications adequate to direct the builder in constructing the works so that they conformed to the desired structures.

The early flood-control acts were based upon such sketchy information that it was found desirable to insert an additional step in planning between the surveys and the working drawings. This became known as a definite project report which in the Corps of Engineers' program was originally financed from construction funds.

During World War II construction of works not vital to the war effort was stringently curtailed. This meant that funds for construction were greatly limited and moneys needed for preconstruction planning were not available.

During World War II it was recognized that there could be a serious economic dislocation in the transition from war to peace. During such a period it might become desirable to accelerate the Federal con-

struction program greatly. At one time it was estimated by economists that there would be a peak of 8,000,000 unemployed in the year immediately following the termination of hostilities.

The experience of 1933 was recalled. In that year it was desired to launch Federal construction works as a pump-priming effort to the faltering construction industry. Within 2 days after the National Industry Act became law, a program involving $800,000,000 worth of Federal projects was set up. Although ultimately 98 percent of this program was built, some projects were not underway until 18 months later. Further, 18 months after the launching of the program, only 100,000 persons were directly engaged in this construction work. One of the principal obstacles the program encountered was the absence of working drawings and specifications. It generally took 12 to 18 months to prepare these.

With recognition of past experience, it was decided that, in order properly to prepare for the transition from war to peace, some volume of the authorized river and harbor and flood-control construction program should have its plans brought to a stage such that construction could be initiated within a very short time. Accordingly, about 1944 an appropriation was requested and made for planning. These funds were available both for the definite project category of work and for the preparation of detailed plans and specifications.

With the cessation of hostilities and the resumption of a large construction program, a separate allotment for planning was not necessary, but a habit had been formed. And a new expedient had been developed. On the basis of the habit, it was easy to continue a specific annual allotment for planning. The expedient was one which arose in the legislative branch for easing pressures. As an alternative to providing funds for the initiation of construction of various projects, it was frequently found sufficient for the immediate problem to provide a limited amount of money for the planning of specific projects. Thus the general attempt at administrative preparedness deteriorated into a practice of legislative selection of the advance planning program.

During the fiscal years 1945 to 1953, a total of $49,900,000 was appropriated for planning of river and harbor and flood-control projects. Of this sum $12,173,000 has been spent on river and harbor projects on which construction has not yet been started and $26,637,000 on flood-control projects of like status, a total of $38,800,000. When it is recognized that a number of these projects may never be built and that in any event plans will need to be revised greatly, the waste involved in the current practice is obvious.

Your subcommittee is of the opinion that the allocation by Congress of specific amounts of funds for planning specific projects should be stopped. It is further of the opinion that planning in the nature of preparing working drawings and specifications should be a charge against construction and should be included in the allotment for initiating construction of a specific project or integral unit of a basin program. The subcommittee is, however, of the opinion that an additional step in development is needed between the approval of broad basin plans and the construction of integral units thereof. As discussed hereinafter, it believes that there should be made available to the Committee on Public Works for its review special reports on the integral units within approved basin plans for which it is proposed that construction funds be made available in the immediate future. There is, therefore, included in the recommendations of the subcom-

mittee the proposal that an annual amount be made available to the Chief of Engineers for the preparation of more detailed reports on the specific units of approved basin plans for which he proposes to request construction funds in an early budget.

Your subcommittee recalls that it is the Committee on Public Works which has fostered the program of Federal aid in the advance planning of non-Federal public works. It is aware that the rate of military and naval construction during June 1952 was approximately 10 times the rate experienced during the year 1947 and that with the completion of the present defense construction program it may become necessary to accelerate other Federal construction. It will be necessary for the construction agencies of the executive branch to be prepared to meet such a situation. On the other hand, the practice that has arisen of designating small driblets of funds for the allocation to planning of specific projects, a practice which well merits the charge of pork barrel, should be stopped in the best interests of administration of our water-resource development program.

Economic Justification

The subcommittee considers the question of economic justification of projects of sufficient importance to devote a separate report to it. The conclusions and recommendations of this report can be considered independently of the subcommittee's findings in the broad subject of economic justification. Nevertheless, it believes that a few remarks will be helpful as background in this report.

The Flood Control Act of 1936 stated in section 1 that the Federal Government should improve or participate in the improvement of navigable waters and their tributaries for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs and if the lives and social security of people are otherwise adversely affected. No such specific criteria have been established by law for river and harbor improvements in the interest of navigation and related purposes. The general practice has been to consider a project justified if the district engineer has been able to provide a computation in which estimated benefits exceed estimated costs. Such a finding will depend on what are considered to be benefits and how both they and the costs are evaluated. The measure of costs can vary greatly depending upon whether interest during construction is considered, the interest rates used, and the estimated life of the project for amortization purposes.

The concern of the Chief of Engineers, United States Army, with the subject was indicated in his testimony before the subcommittee. At one point he said:

> I think that the committee should insist that a sound method—if the one that is being employed now is not considered sound—that a sound method be arrived at for determining the economic justification for projects.

Subsequently he stated:

> If you establish a criteria which will raise the benefit requirements, then you cut down the number of favorable reports.

Finally, in response to a request for suggestions to the committee, he said:

> Set a definite policy for the figuring of economic benefits and make that uniform for all Government services involved in this kind of program.

The subcommittee believes that, regardless of how the economic justification is determined, only those projects in which the estimated benefits are well in excess of the estimated costs should be undertaken during a period of high construction costs, high over-all employment, and limited availability of materials. With an authorized backlog of the size that now exists and under the existing economic and defense situation, the subcommittee can see little value in merely translating wealth and resources from one form to another. That is exactly what is done when a project in which benefits and costs are approximately equal is undertaken. A project cannot be expected to create wealth unless the benefits are clearly in excess of the costs.

As already mentioned in connection with the subject of segregating authorized projects into two lists, active and inactive, the faultiness of present practices in economic evaluation is apparent when it is stated that a number of the authorized projects recommended by the Corps of Engineers as economically justified will never be built. While the Chief of Engineers has stated that the committee should insist that a sound method be arrived at for determining the economic justification for projects, the subcommittee is not aware that the Chief of Engineers has been in any way impeded by Congress in developing the sound procedure he seems to believe is now needed. He has never been required to state that an unsound project was economically justified.

The subcommittee believes that a skeptical approach should be taken in the acceptance of favorable economic analysis based entirely on theoretical and mathematical computations. A more practical measure of the worthiness of an undertaking is the willingness of the immediate beneficiaries to participate in the work by the contribution of funds proportionate to the local benefits.

Organization

Because of its responsibility for the omnibus river and harbor and flood-control bills, it is frequently considered that the principal concern of the Committee on Public Works in the field of water-resource development is with the Corps of Engineers. However, the flood-control acts have also established the framework for operations of the Department of Agriculture in the field of runoff and water-flow retardation in the interest of flood control. Many projects prosecuted by the Bureau of Reclamation have been authorized under river and harbor and flood-control legislation. These included the middle Rio Grande project; the Central Valley project, California; the Missouri River Basin program; Colorado River front work in Arizona and California; and individual projects on the Colorado River, Tex.; on the Columbia River; and on several streams of the Southwest. The Public Works Committee is basically responsible for legislation concerning the Tennessee Valley Authority and the Bonneville Power Administration. It is responsible for the legislation authorizing the establishment of the Southwestern and Southeastern Power Administrations under the Department of the Interior. It has responsibility for some of the functions of the Federal Power Commission. Because of this, the committee has not only an oversight responsibility for the projects authorized under legislation it has sponsored, but also it has properly a concern in the question of organization of the executive branch for the accomplishment of the various projects in execution of the functions stemming from these laws.

During the course of its hearings and other studies, three major aspects of organization have been brought to the attention of the subcommittee. These are (1) the consolidation of water resource development activities within a single executive agency, (2) the coordination of field work of existing agencies through the use of river basin committees, and (3) the establishment of a board of review.

The agencies responsible for Federal activities in the field of water-resource development are not working in complete harmony or with satisfactory coordination.

General Pick, Chief of Engineers, United States Army, testified:

> Differences of opinion and disagreements have existed and some still remain between the Corps of Engineers and other Federal agencies regarding certain aspects of water-resource development, just as differences are common between bureaus in a single department. These are due to divergent laws, differences in basic philosophy, and inherent physical conflicts as to uses of water. While some of these differences are of primary importance, the area of disagreement between agencies, in my opinion, is very small insofar as the civil-works program is concerned. It is regrettable that these honest divergencies of thought have been magnified by critics to overshadow the sound advances that have been made by Federal agencies toward coordination and cooperation.
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> Let me say first of all that I think everybody recognizes the tendency of a reporter or writer to emphasize the arguments that go on between people rather than the areas of agreement.
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> I would like to say, Mr. Chairman, with respect to the differences of opinion which exist among Members of the Congress, and in a smaller degree, I think, among some of the Federal agencies, that, after all, what we are all trying to do—and the very reason I am here today, and the reason the rest of the folks have appeared before this committee—is to try to talk this thing out and get down to a sound basis of cooperation and integration for the ultimate development of these lands in the best, most practicable, and efficient way. There sure is, and I say very frankly there is need for integration of our efforts more than we are getting now.

Commissioner of Reclamation Strauss included the following in his testimony:

> The Bureau of Reclamation and the Corps of Engineers have a particularly difficult task of coordination. Operating in the same river basins of the West, their authorities and responsibilities overlap, and in many cases their basic laws and policies diverge. Under these circumstances it is not strange that there have been differences between the agencies. I am convinced that sincere efforts have been made consistently and are being made at the present time to resolve these differences. Agreements have been consummated in the Columbia, middle Rio Grande, and Missouri Basins, and those projects are testimony to the success of these efforts. In other areas, notably the Central Valley, conflicts have arisen that are still unresolved.
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> In most part these conflicts can be traced directly to different or overlapping basic law and responsibilities. In all areas, however, where the Bureau and the corps are carrying on parallel studies, investigations, and activities, there is unavoidably a substantial measure of some duplication, particularly as to administration and overhead. But we keep that to a minimum, and we exchange basic data between the agencies.

These witnesses apparently make some effort to have their agencies work together notwithstanding the basic differences in philosophies and differences in legislation under which they carry out their share of the whole program; yet they tend to minimize the differences among their agencies. There are indications that, at least at lower echelons of the organizations, efforts to work together and bring about a single unified plan of development for a single river basin are

less than wholehearted. Most of these difficulties could be overcome quickly if top-level efforts toward coordination and cooperation were more sincere.

A report of the Commission on Organization of the Executive Branch of Government submitted to Congress in 1949 recommended the consolidation of the water-resource development activities of the Bureau of Reclamation with the river and harbor and flood-control activities of the Corps of Engineers. Legislation to effectuate this proposal has been placed before Congress but has generally been referred to committees other than this. The President, notwithstanding his authority to reorganize the executive branch of Government, has not recommended any such consolidation. The views of the Department of the Army in opposition to such a consolidation were presented to the subcommittee in a copy of a letter dated May 4, 1951, from the Secretary of the Army addressed to the chairman of the Senate Committee on Expenditures in the Executive Departments, reproduced on pages 124 to 126 of the hearings. There has also come to the attention of the subcommittee a statement of the Citizens Committee for the Hoover Report in support of such a consolidation.

The subcommittee is far from convinced that the advantages of consolidation would outweigh the disadvantages. The major cost of the operations of these agencies is in the projects they undertake. Merely placing the work of several agencies under a single Cabinet officer with the work continuing at the same volume and under the same laws would require essentially the same number of people (probably the very same people) with the same conflicts that now exist. It is an extreme of oversimplification to think that the problems can be solved by reorganization or redesignation or by the establishment of a new body to undertake an additional review. And the subcommittee does not subscribe to the contention of some that competition between agencies is healthful.

The subcommittee believes that there is a definite limitation upon the amount of work that any organization can do efficiently. The consolidation of the water-resource development work of these various agencies in a single national agency would possibly militate toward decreased efficiency.

Voluntary interagency committees have been in existence since late in 1943. These committees, the subcommittee believes, have made a contribution to the elimination of interagency conflicts. It is noted, however, that they are empowered to act only when there is unanimous agreement. As a result, accomplishments are slight, and it is apparent that something more positive must be undertaken.

The Committee on Public Works in effect sponsored an interagency committee for coordination when in the Flood Control Act of 1950 it authorized and directed the Secretary of the Army to cause to be made under the direction of the Chief of Engineers a preliminary examination and survey of the Arkansas-White and Red River Basins—

> with a view to developing comprehensive, integrated plans of improvement for navigation; flood control; domestic and municipal water supplies; reclamation and irrigation; development and utilization of hydroelectric power; conservation of soil, forest, and fish and wildlife resources; and other beneficial development and utilization of water resources including such consideration of recreation uses, salinity and sediment control, and pollution abatement as may be provided for

under Federal policies and procedures, all to be coordinated with the Department of the Interior, the Department of Agriculture, the Federal Power Commission, other appropriate Federal agencies, and with the States, as required by existing law.

The survey is presently being undertaken by forces of the various Federal agencies concerned, and coordination is being sought through the use of the interagency committee under the chairmanship of a representative of the Corps of Engineers. The coordinated report is scheduled to be completed by June 30, 1954, but this date may not be met if adequate appropriations are not forthcoming.

Your subcommittee believes that the work and operations in accomplishment of this survey should be carefully scrutinized by the Committee on Public Works in order to determine the degree of soundness in this means of providing coordination and elimination of conflicts.

Your subcommittee is convinced that, for the maximum economic return from Federal water resource developments, a single integrated plan must be developed and provided for each stream. It is of the opinion that the processing of unintegrated segments through different committees and the ultimate enactment of conflicting projects can lead only to waste and a chaotic situation. It believes that no segment of a plan should be approved by any committee or enacted by Congress so long as major conflicts exist between such segment and the parts properly under jurisdiction of some other element of the executive branch. The insistence of Congress upon coordination through its refusal to authorize conflicting elements would probably bring about the necessary coordination more quickly than any amount of reorganization. The agencies of the executive branch must be shown that they cannot attain their conflicting ends by playing one committee of Congress against another.

REVIEW BOARD

The Commission on Organization of the Executive Branch of Government recommended the establishment of a board of impartial analysis and review. Two bills, H. R. 3679 and H. R. 3318, of the Eighty-secondCongress, which would authorize the establishment of such a review board within the executive branch have been referred to the Public Works Committee. Numerous witnesses before the subcommittee recommended the establishment of a review board responsible directly either to the President or to the Congress.

There is available to the President at the present time the Bureau of the Budget which is his staff arm to provide, in addition to formulating the details of his annual budget and fiscal program, for necessary administrative improvement and proper coordination among the elements of the executive branch. An Executive order was issued some years ago providing for the Bureau of the Budget to undertake the principal responsibilities that the proponents of a review board would have placed in such a board. There seems to be some thought that, in the present absence of certain policy criteria, a review board could provide needed answers. If such policy determinations were clearly enunciated, the apparent need for a review board would largely vanish, and the necessary coordination could as readily be accomplished by the Bureau of the Budget as by any independent board. It would appear, therefore, that there is no need for the establishment of an additional body in the executive branch to undertake these functions.

Possibly the staff of the Bureau of the Budget should be strengthened in order properly to carry out this responsibility, but this is a matter for the Chief Executive to determine and, if he sees fit, to request necessary funds for such strengthening.

The establishment of a special review board exclusively responsible to the legislative branch would constitute a new device in government. Its relationship to the various existing committees concerned with the same subject matter would create a new problem. The Legislative Reorganization Act of 1946 was directed to increasing the strength of the staff of the legislative branch in its consideration of problems identical in character with those which would be given to such a review board. The subcommittee believes that the employment by the committees of an adequate number of properly qualified professional members as contemplated under the Legislative Reorganization Act would enable the various committees concerned to be provided with any information they might need of the character proposed to be furnished by a review board.

Conclusions

On the question of organization, then, the subcommittee is of the opinion that present problems would not be solved in any marked degree by simple reorganization or by the establishment of a special board of review. It does believe that the conflicts among the agencies in the executive branch must be eliminated and greater coordination must be effected. Further, it is of the opinion that, if Congress were to establish clearly four elements of policy, much of the apparent need for reorganization and for establishment of a review board would cease to exist. These four elements are (1) phases in water-resource development for which the Federal Government should assume some responsibility and some measure of the degree of that responsibility, (2) the place of local and State interests in the Federal development of water resources, (3) uniform standards for use by the executive branch for the measurement of the economic justification of water resource development projects, and (4) uniform standards for the allocation of costs in multiple-purpose projects and uniform criteria for the establishment of rates for the sale of products to recover such costs.

The subcommittee considers these elements of such importance that it proposes to submit separate reports covering the subject within the limits applicable to the Committee on Public Works.

The subcommittee would at this time prefer to see existing functional responsibilities of the executive departments remain generally where they are now placed. It would like to see the existing river basin interagency procedure extended geographically and strengthened, possibly by the addition of an independent chairman responsible directly to the Executive Office of the President. If conflicts among the agencies cannot be resolved with the existing distribution of functional responsibilities, the subcommittee believes it probably will invite the consideration of a new approach for the resolution of the many conflicts.

The recommendations set forth in this report can be brought about within the existing organizational structure and under present functional assignments. The subcommittee believes that they constitute the minimum to be effected.

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